

Office of the Assistant Secretary
National Oceanic and Atmospheric Administration
1401 Constitution Ave. NW
Washington, DC. 20230

October 21, 2023

Re: Request for Information on Equitable Delivery of Climate Services

Dear Assistant Secretary James:

On behalf of Public Citizen, a national public interest advocacy group with more than 500,000 members and supporters, we welcome the opportunity to respond to the National Oceanic and Atmospheric Administration’s (NOAA) request for information on the Equitable Delivery of Climate Services.¹ We commend NOAA for translating climate information into practical tools for decision makers and building capacity for planning and adapting to climate risk.

Homeowners, state and local governments, businesses, and financial institutions face myriad challenges and difficult decisions while pursuing climate adaptation, resilience, and mitigation. Leveraging NOAA expertise to provide accessible tools and services will help decision-makers predict, prepare, and adapt to climate-related risks.²

There is an urgent need for NOAA to provide usable public climate data and models to inform the public’s decisions about how to adapt and mitigate climate risk — starting with the simplest questions like when to move and where to live. NOAA is already a strong climate financial risk communicator, for example in its tracking and publicizing billion-dollar weather and climate disasters. This mounting evidence underscores the escalating financial costs associated with climate risks. In 2022 alone, eighteen natural disasters resulted in \$165 billion in costs.³

Decision makers need reliable data and modeling to mitigate growing climate risks, yet private climate service firms have so far outpaced public sources. The federal government’s role in developing resource-intensive global climate models has not translated into an equivalent dissemination of science people can use to make adaptation decisions.⁴ Rather, an increasingly concentrated industry of private “climate service” firms has dominated this arena, whose services

¹ National Oceanic Atmospheric Administration, “[NOAA seeks public comment to inform more equitable climate service delivery](#),” July 20, 2023.

² Denisa Ogoya, “[What Are Climate Services and What Benefits Do They Have?](#),” Earth.org, October 7, 2022.

³ Nathan Rott, “[Extreme weather, fueled by climate change, cost the U.S. \\$165 billion in 2022](#),” NPR, January 10, 2023.

⁴ Madison Condon, “[Climate Services: The Business of Physical Risk](#),” 55 Arizona State Law Journal 147, Boston Univ. School of Law Research Paper, March 22, 2023.

are often either too costly for individuals to afford or who offer limited information before the public hits a paywall.⁵

Climate change is rapidly altering the patterns and severity of extreme weather, expanding the geographic reach of perils to regions that are not prepared for them. With risks outpacing available tools to evaluate them, those without the tools to understand climate risks are increasingly trading one hazard for another. A 10-year study of migration found that more Americans were fleeing hurricanes but moving towards areas most affected by wildfires.⁶ As climate risks spread, Americans are increasingly engaging in a “massive game of migratory musical chairs” in which they must choose between various climate-related perils that are increasing in frequency and severity.⁷

To support adaptation and help homebuyers and local governments make informed choices about complex risks, NOAA should make climate data available as public good. As a report from the President’s Council of Advisors on Science and Technology asserts, Americans urgently need access to “operational climate science” to improve climate-related risk assessment and mitigation.⁸

Low-income communities and communities of color will be harmed most by the reliance on private analytics and insurance premiums as climate risk indicators of last resort. These communities are more likely to be located in areas at risk of flooding and wildfires,⁹ and the same may be true of other climate-related risks. Marginalized communities and their municipal governments need accurate, accessible modeling to inform decisions about where to live and where to build, how to adapt or build resilience, how to plan and support infrastructure and economic development, and more. NOAA should reach out to these communities, relevant organizations, and government bodies to assess needs and determine how best to provide services. It should also organize place-based convenings to hear directly from groups and community members.

Advance predictions of climate impacts offer crucial opportunities to prepare which creates significant economic benefits and cost savings. Presently, there exists a gap in equipping the public and decision makers with the tools to use information on climate impacts to mitigate climate-related financial risks. NOAA can bridge the gap between climate scientists and decision

⁵ Madison Condon, “Climate Services: The Business of Physical Risk,” 55 Arizona State Law Journal 147, Boston Univ. School of Law Research Paper, March 22, 2023, p. 184.

⁶ Mahalia Clark, Ephraim Nkonya, and Gillian L. Galford, “Flocking to fire: How climate and natural hazards shape human migration across the United States,” Front. Hum. Dyn., Vol. 4, December 8, 2022.

⁷ Raina Hasan, “Weathering the Storm: Establishing Internally Displaced People's Right to Affordable Housing in the Wake of Natural Disasters,” 31 J.L. & Pol’y 177, 2022.

⁸ Executive Office of the President, President’s Council of Advisors on Science and Technology, “Extreme Weather Risk in a Changing Climate: Enhancing prediction and protecting communities,” April 2023, p. 9.

⁹ Leigh Beeson, “Wildfires disproportionately affect the poor,” UGA Today, September 19, 2023; Christopher Flavelle, Denise Lu, Veronica Penney, Nadja Popovich and John Schwartz, “New Data Reveals Hidden Flood Risks,” New York Times, June 29, 2020.

makers by working with federal agencies to combat the climate crisis. This can be achieved by expanding interagency work in the federal government and developing greater communication channels to the public. The following are opportunities to increase interagency work and partnerships to embed climate science in financial-sector decision making in particular.

NOAA should establish climate services to help financial regulators mitigate climate-related financial risk of depository institutions.

Financial regulators engage with an array of stakeholders, including investors, insurers, and financial service providers, who need information on climate-related physical risk to mitigate it appropriately. Financial regulators and financial institutions are increasingly assessing physical climate risk to implement risk mitigation and adaptation measures at both the individual firm and systemic level. For this, many private sector climate analytics companies are already converting climate data into financial risk assessments, exemplified by initiatives like First Street Foundation's Flood Factor scores. However, these tools primarily involve processing NOAA's climate models and data sources into more usable formats.¹⁰ Likewise, NOAA should leverage its well-established climate models and data sources to develop alternative accessible and credible public tools.¹¹

NOAA should position itself as the primary source of scientific expertise in the application of climate-related financial risk. This includes offering public climate services to assist financial regulators and institutions develop more comprehensive approaches to evaluate portfolios and assets' climate-related financial risk. Financial regulators and institutions need granular, asset-level data on exposure to physical risk to make appropriate risk management decisions.¹² NOAA's Regional Integrated Sciences and Assessment should further enhance its efforts to provide more detailed and granular data to help financial institutions assess loan-level climate-related financial risk. This is crucial because relying solely on General Circulation Models (GCMs) and Regional Climate Models (RCMs) may lead to an underestimation of physical climate risk. By downscaling regional climate models, NOAA can offer a more comprehensive and precise understanding of exposures.¹³

A current example of the value of asset-level data comes from the Federal Reserve's initial Pilot Climate Scenario Analysis. The exercise requires financial institutions to project risks at the level of individual loans in their residential and commercial real estate portfolios. Any scenario analysis is only as good as the scenarios one uses to conduct it. In addition to asset-level data,

¹⁰ Madison Condon, "Climate Services: The Business of Physical Risk," 55 Arizona State Law Journal 147, Boston Univ. School of Law Research Paper, March 22, 2023, pg. 17.

¹¹ Lee Harris, "Rise of the Climate Rating Agencies," The Prospect, April 12, 2023.

¹² BNP Paribas Asset Management, "Asset-level data is crucial to avoid underestimation of physical climate risk," December 6, 2023.

¹³ Tanya Fielder, et al., "Business risk and the emergence of climate analytics," Nature Climate Change, 11, pages 87–94, February 8, 2021.

financial institutions and regulators need a better general understanding of the types of risks that may materialize on various time frames—including tail risks, not just projections near the center of distribution curves. Current forms of scenario analysis grossly underestimate climate-related risk, omitting many physical risks, as well as tipping points.¹⁴ NOAA's support can greatly enhance the Federal Reserve's efforts to develop climate scenarios that realistically represent chronic and acute physical risks. For example, one of NOAA's regional centers, the Great Lakes Integrated Sciences and Assessments, has already developed plausible narrative scenarios for city planners that describe climate impacts to specific-sectors.¹⁵ GLISA created practical tools for practitioners to use NOAA's climate data in scenario planning and analysis. This model of scenario analysis can be expanded on both a national and to other regions in coordination with financial regulators.

NOAA should contact and partner with financial regulators to educate them, ascertain their needs, and determine how best to make climate services available both to them and to the entities they regulate and supervise, many of which have very little understanding of physical climate-related risk.¹⁶ NOAA should assist bank regulators in implementing and assessing climate-related financial risk management in collaboration with the Office of the Comptroller of the Currency, Federal Deposit Insurance Corporation, and Federal Reserve. To bridge the gap between climate science and economics, NOAA should be actively involved in the Treasury's Climate Data and Analytics Hub on translating climate data to financial risk. This could include scenario generation, providing granular climate data, and projecting and assessing realistic climate risk impacts.

Furthermore, many smaller, resource-constrained depository institutions, including credit unions, community development financial institutions, and minority owned depository institutions, lack the resources to gather climate-related data and develop appropriate models. NOAA should partner with their supervisors, including the National Credit Union Administration and state banking regulators like New York Department of Financial Services, on how best to make relevant information and modeling accessible—possibly by developing particular data sets or models in partnership with financial regulators and, in any case, likely making resources available directly through those regulators' platforms. One such avenue is coordination with the Federal Financial Institutions Examination Council. NOAA can develop a usable toolbox for financial institutions to assess climate-related financial risk. This process can start with

¹⁴ Sandy Trust, Sanjay Joshi, Tim Lenton, and Jack Olive, "[The Emperor's New Climate Scenarios](#)," Institute and Faculty of Actuaries, July 4, 2023.

¹⁵ Great Lakes Integrated Sciences and Assessments, "[Future Climate Scenarios for Great Lakes Cities](#)," University of Michigan.

¹⁶ Financial regulators managing climate-related financial risk include the Federal Reserve, the Office of the Comptroller of the Currency, the Federal Deposit Insurance Corporation, the National Credit Union Administration, the Commodity Futures Trading Commission, the Treasury, which includes the Financial Stability Oversight Council, Federal Insurance Office, and Office of Financial Research, as well as the Federal Financial Institutions Examination Council, Federal Housing Finance Agency, and state financial regulators.

collaborating with a group of representative regulators to identify specific needs and relevant applications before expanding services more broadly. In all cases, the resources should be made available to the general public as well, so that researchers and public interest advocates can add to the body of knowledge developed from them and engage in public oversight of financial regulators and the institutions they supervise.

NOAA should support efforts to evaluate proprietary catastrophe models and explore the development of public models.

In the insurance sector, there is a crucial role for NOAA and its partnership with the National Science Foundation in addressing growing concerns about the industry’s use of catastrophe models.¹⁷ As climate change alters physical risks, the use of forward-looking information has become increasingly important for preparing for them. In many states, insurers rely on the use of computer models that simulate potential catastrophes.

However, these models present several problems not just for accuracy but also for equity, consumer protection, and public participation. The “black-box” nature of proprietary models makes it difficult for most regulators to evaluate the models and their inputs, which means it is difficult to determine whether the models contribute to insurers overcharging consumers, whether intentionally or unintentionally. As it becomes increasingly important for regulators to determine whether low-income communities and communities of color are paying more due to unfair discrimination or genuinely higher environmental risks, the potential for proprietary models to hide algorithmic bias is particularly concerning.¹⁸ Additionally, the integration of climate models remains limited and, while hurricanes models widely are used, catastrophe models for perils like wildfires are less developed.¹⁹ Overconfidence in opaque models could lead consumers, insurers, regulators, and policymakers to misjudge risks.

Additionally, the high price for access effectively shuts out the public and local governments. Yet the private climate service firms that charge high prices for access to proprietary catastrophe models rely heavily on public data.²⁰ Just as climate data should be considered a public good, advancements in catastrophe modeling should be used for the public benefit, particularly when they are grounded in public data.²¹

¹⁷ Gary Quackenbush, “[California insurance workshop addresses legal, transparency issues](#),” North Bay Business Journal, July 31, 2023

¹⁸Jen Frost, “[Is catastrophe modeling the answer to California's property insurance woes?](#),” Insurance Business Magazine, July 28, 2023.

¹⁹ NOAA-NSF Climate Webinar Series, “[Connecting the Insurance Industry and Academia on Catastrophe and Climate Modeling: Webinar Series—Introduction](#),” American Academy of Actuaries.

²⁰ Madison Condon, “[Climate Services: The Business of Physical Risk](#),” 55 Arizona State Law Journal 147, Boston Univ. School of Law Research Paper, March 22, 2023.

²¹ Ibid.

As NOAA and NSF develop the research center on climate and catastrophe modeling, both agencies should ensure that the insurance industry is not the only beneficiary of additional data and climate modeling capacity.²² The center should help support the development of mechanisms for greater regulatory oversight of proprietary models, as well as the development of public models. A report from the President’s Advisory Council on Science and Technology provides a detailed outline of ways that NOAA and other agencies can coordinate to improve public oversight and evaluation of proprietary catastrophe models and develop public catastrophe models.²³

Conclusion

The ongoing climate crisis demands leadership from NOAA to inform the public’s understanding of risks and choices about adaptation and mitigation. NOAA should provide robust public sources of climate data and models to effectively communicate risk to regulators and the public. Furthermore, NOAA should support financial regulators in mitigating climate-related financial risk by developing climate services for public oversight, such as climate scenarios, physical risk data, and catastrophe models, and ensure that tools are beneficial to consumers, regulators, and public policymakers.

For questions, please contact Mekedas Belayneh at mbelayneh@citizen.org, Carly Fabian at cfabian@citizen.org, and Ishmael Bucker at ibucker@citizen.org.

Thank you,

Public Citizen

²² National Oceanic Atmospheric Administration, “[NOAA and NSF to create research center in response to insurance industry climate needs](#),” May 16, 2023.

²³ President’s Council of Advisors on Science and Technology, “[Extreme Weather Risk in a Changing Climate: Enhancing prediction and protecting communities](#),” April, 2023, p. 9.